Fig. 1

201 Sender ← ···· Message ···· → Receiver 207

Message

202 Segmentation   Statistics   Assembler 206

Segment   Segment

Segment Buffer → Controller   Controller → Receiving Buffer 205

204 Rate Control

UDP ← ACK → UDP
Data Packets
203

Fig. 2

```
0                   1                   2                   3
0 1 2 3 4 5 6 7 0 1 2 3 4 5 6 7 0 1 2 3 4 5 6 7 0 1 2 3 4 5 6 7
```

Ver	S Y N	N U L	S H T	0	Rsv	Total Segs	Segment Size
Wall Clock							
Sequence Number							
Total Segments Sent							

(a) Data Packet Header

Fig. 3a

```
0                   1                   2                   3
0 1 2 3 4 5 6 7 0 1 2 3 4 5 6 7 0 1 2 3 4 5 6 7 0 1 2 3 4 5 6 7
```

Ver	S Y N	N U L	S H T	1	1	A C K	Resv	Segment Size
Wall Clock									
Ack Sequence Number									
Extended Ack Sequence Number									
Bandwidth Measured From Receiver Side									
The Mean Deviation of Bandwidth Measured From Receiver Side									
The Packet Loss Rate									
The Mean Deviation of Packet Loss Rate									

(b) ACK Packet Header

Fig. 3b

Begin

401

Frame in queue ? — No → **End**

Yes

402 — Prio1-frame in queue ? — No

Yes

403 — Compute LST1

404 — LST1>t ? — No → Send Prio1 frame

Yes

Prio2-frame in queue ? — No → Send Prio1 frame

405

Yes

406 — Compute LST2

407 — LST2>t ? — No → Erase frame from queue

Yes

408 — D<(LST1-t) ? — No → Send Prio1 frame

Yes

Send Prio2 frame

Erase frame from queue

Erase frame from queue

409

LST1=Latest Start Time of next Prio1 frame
LST2=Latest Start Time of next Prio2 frame
t=current time
D=Duration of transmission of current Prio2 frame

Fig. 4a

Fig. 46

Start

top frame of the queue is pno1-frame ? — Yes → Block 1 (420)

No ↓

top frame of the queue is pno2-frame ? — Yes → Block 2

No ↓

top frame of the queue is pno1-frame ? — Yes → Block 3

No ↓

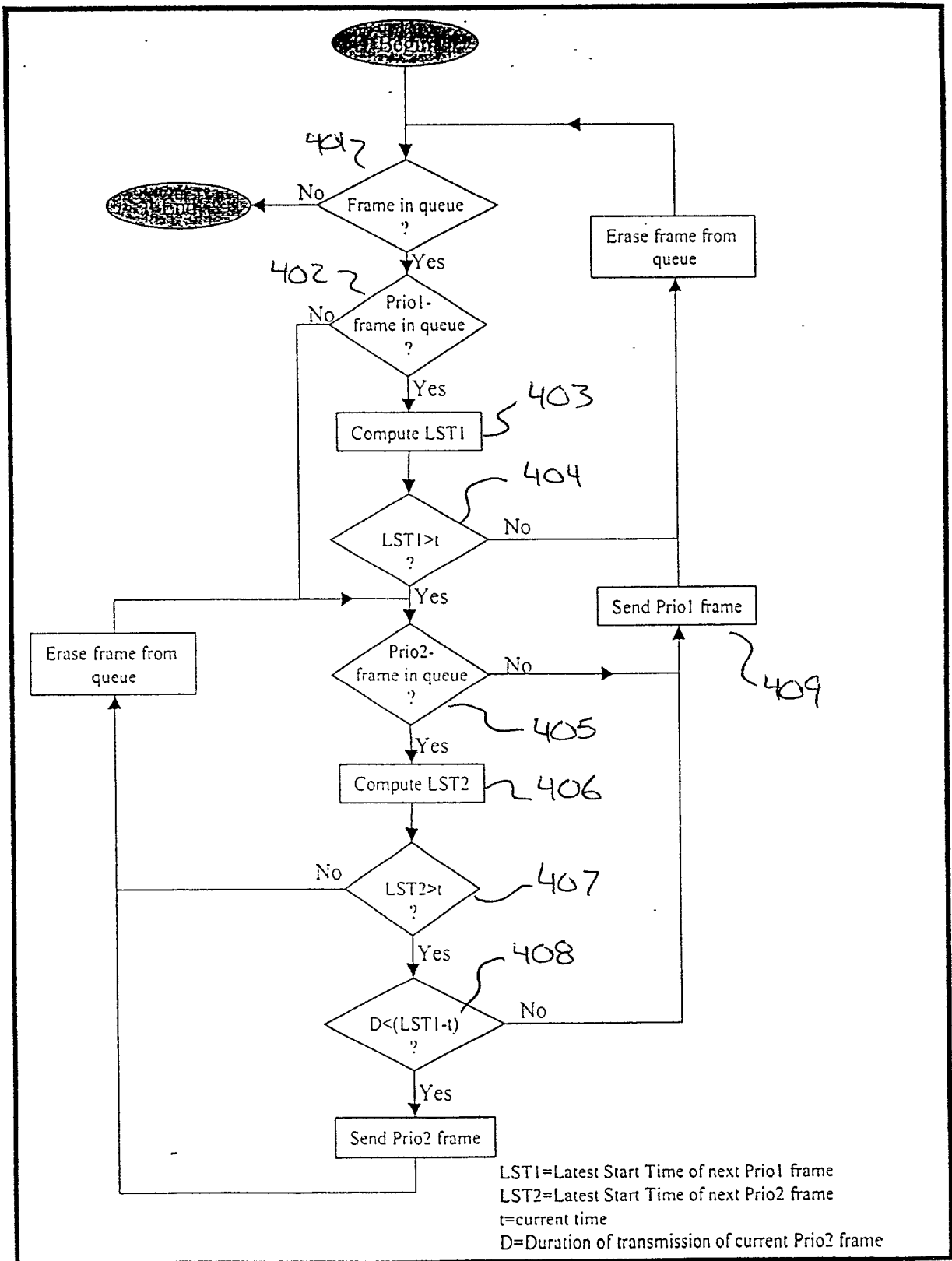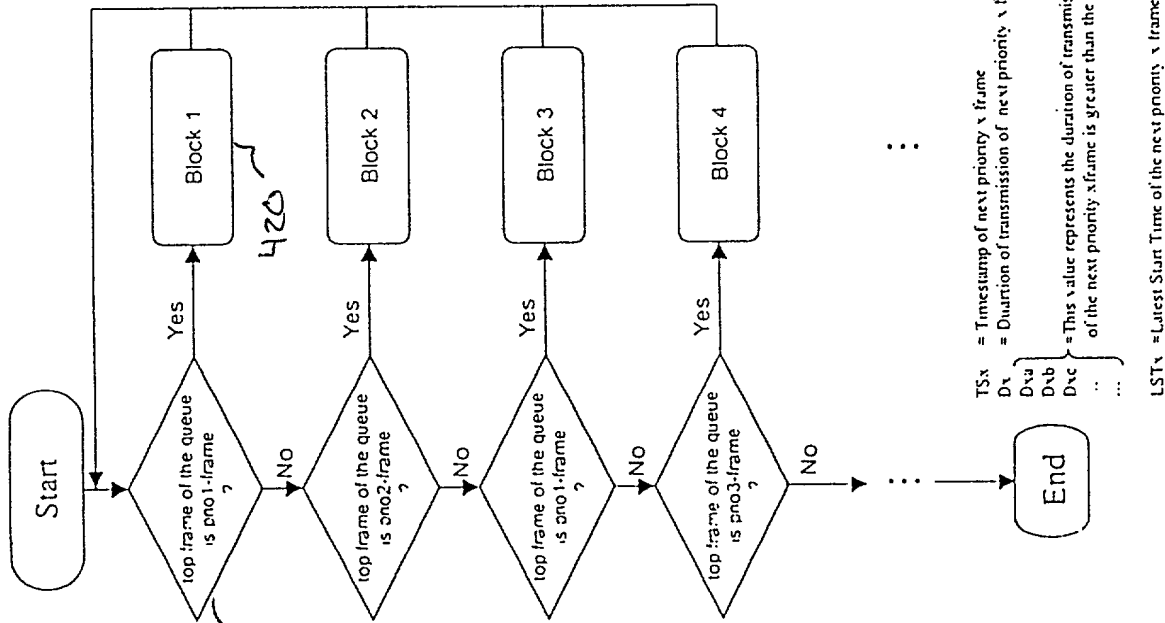top frame of the queue is pno3-frame ? — Yes → Block 4

No → ... → End

TS_x = Timestamp of next priority x frame

D_x = Duration of transmission of next priority x frame

D_{xa}
D_{xb}
D_{xc} = This value represents the duration of transmission and is set to zero, if e.g. the timestamp of the next priority x frame is greater than the one of the next priority (x-1) frame
...

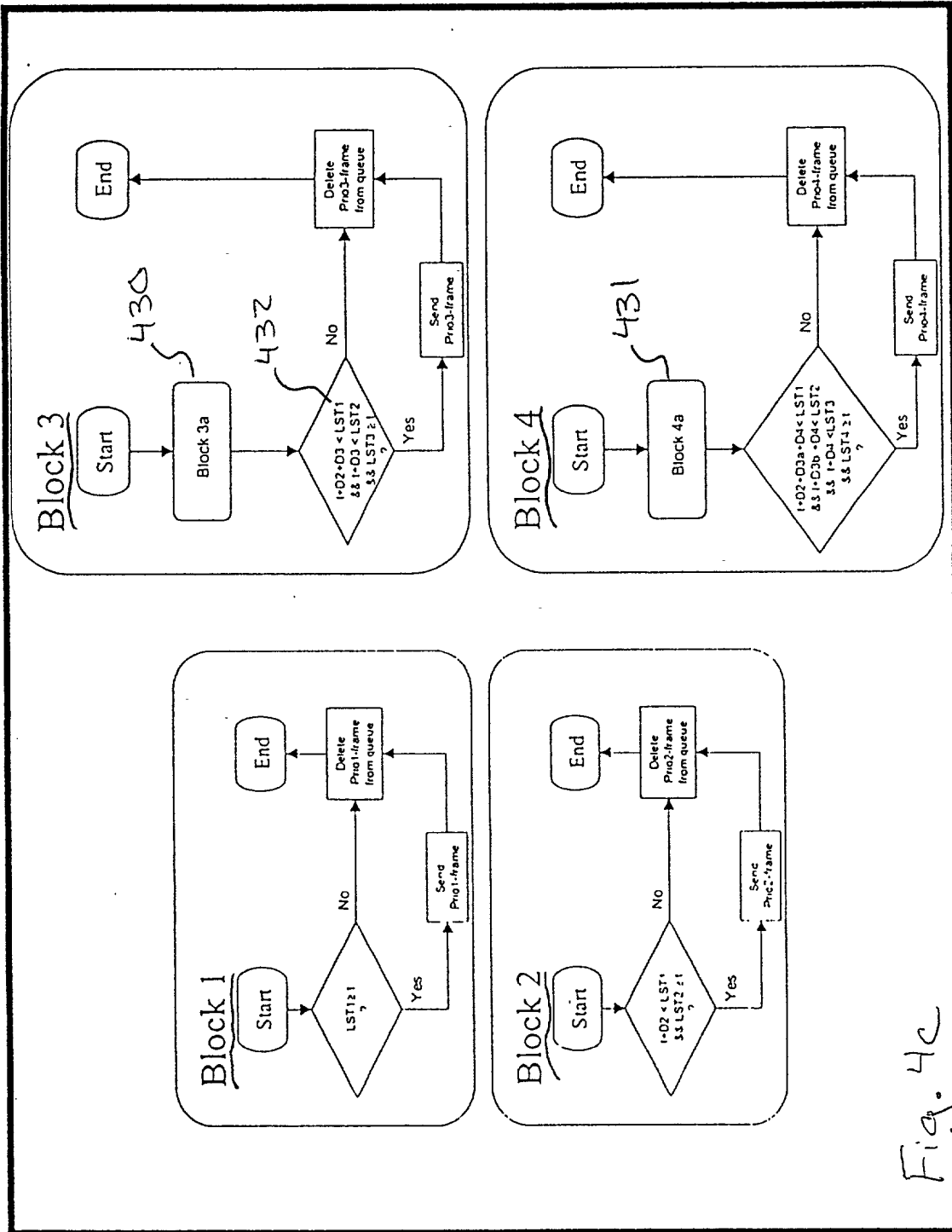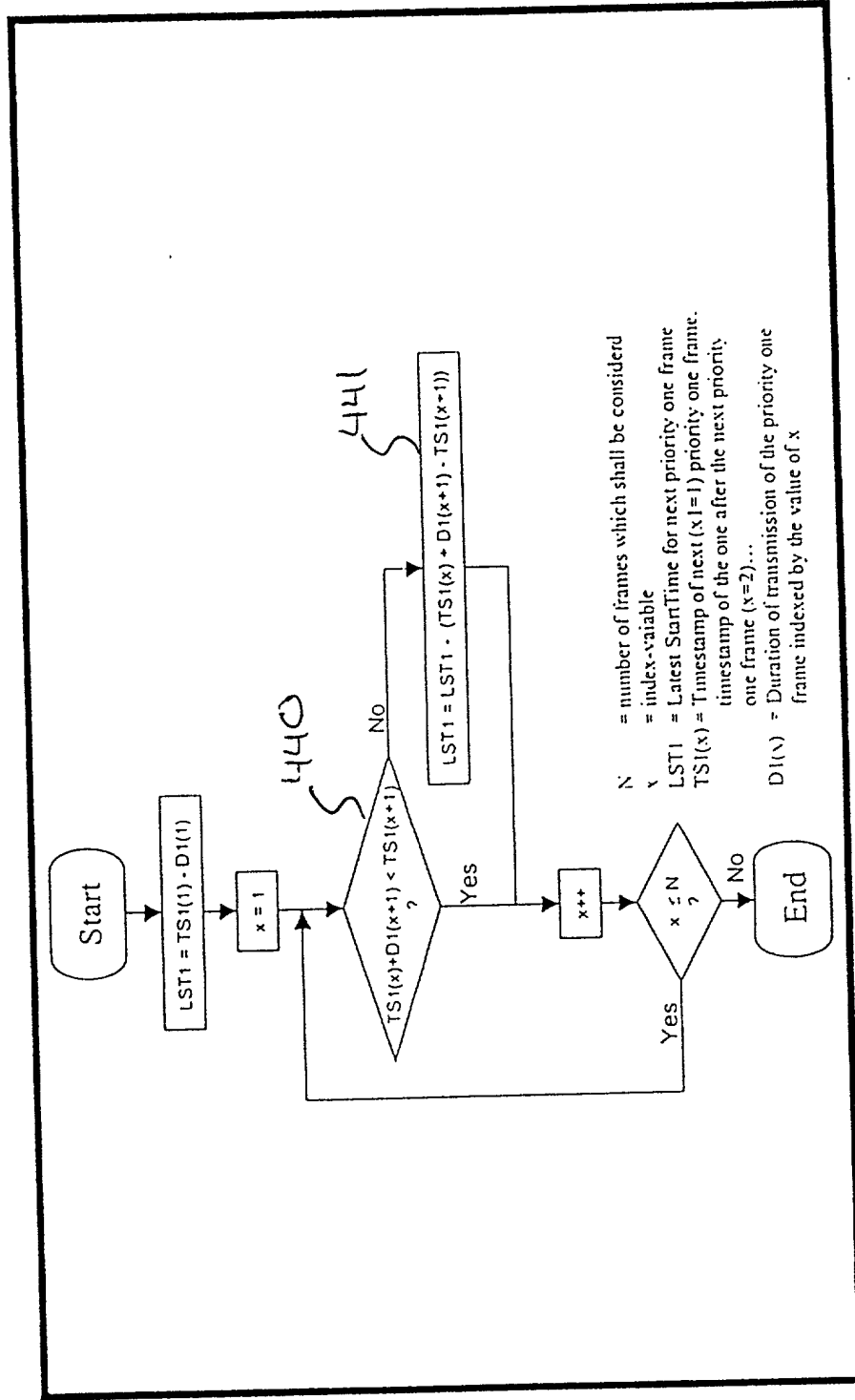LST_x = Latest Start Time of the next priority x frame

Block 3

Start → Block 3a (430)

1+D2+D3 < LST1 && 1+D3 < LST2 && LST3 ≥ 1 ? (432)

Yes → Send Prio3-frame

No → Delete Prio3-frame from queue → End

Block 4

Start → Block 4a (431)

1+D2+D3a+D4 < LST1 && 1+D3b+D4 < LST2 && 1+D4 < LST3 && LST4 ≥ 1 ?

Yes → Send Prio4-frame

No → Delete Prio4-frame from queue → End

Block 1

Start

LST1 ≥ 1 ?

Yes → Send Prio1-frame

No → Delete Prio1-frame from queue → End

Block 2

Start

1+D2 < LST1 && LST2 ≥ 1 ?

Yes → Send Prio2-frame

No → Delete Prio2-frame from queue → End

Fig. 4c

Start

LST1 = TS1(1) - D1(1)

x = 1

440

TS1(x)+D1(x+1) < TS1(x+1) ?

No → LST1 = LST1 - (TS1(x) + D1(x+1) - TS1(x+1))   441

Yes

x++

x ≤ N ?

Yes

No

End

N   = number of frames which shall be considerd
x   = index-variable
LST1 = Latest StartTime for next priority one frame
TS1(x) = Timestamp of next (x1=1) priority one frame, timestamp of the one after the next priority one frame (x=2)…
D1(x) = Duration of transmission of the priority one frame indexed by the value of x

Fig. 4d

Fig. 5

503 — Semantic Information

5025 — Automatic Keyframe Selection

5012 — Video Database

Streaming Server

506 — Controllor

From/to client

504 — CSSS server

To client

505

Data flow
Message flow

Fig. 6

601

603 — SCR Player

From/to Server

Client Controllor

601 — From server

CSSS Player

604 — A/V Render

602 — From server

Data flow
Message flow

frame	f1	f2	f3	f4	f5	f6	f7	f8	f9	f10	f11	f12	f13	f14	f15
priority	1	2	2	2	2	1	2	2	2	2	1	2	2	1	2
timestamp	0	3	4	5	7	8	10	13	14	15	16	17	18	19	21
transmission time	2	1	2	3	1	4	2	1	2	1	3	1	2	3	1

Fig. 7a

701

702

Fig. 7b